

AT THE ENTERPRISES AND INSTITUTES

UDC 666.29.056.5:666.1.058

LIQUID GOLD AND OTHER COMPONENTS USED IN DECORATION OF GLAZED PORCELAIN AND GLASS ARTICLES

N. V. Rovinskaya¹ and E. V. Lapitskaya¹Translated from *Steklo i Keramika*, No. 3, p. 33, March, 1998.

Compounds containing gold are still an important means of decoration of porcelain, faience, and glass products. The attempts to replace gold with other metals, such as organic iron compounds did not bring the expected results. The film imitating gold is not durable enough and has less decorative properties than gold does.

"Liquid gold" compound is produced by precipitating gold from alcohol solutions of gold salts sulfurized with gum turpentine and subsequent dissolution of the precipitated gold terpene sulfide in organic solvents. In order to fix the gold film during firing of the products and improve the properties of the compound, organic compounds of certain metals and polymeric substances are added to the solution [1].

It is known that the quality and decorative appearance of the coating obtained with this compound depend on the technological parameters of its production [2] (sulfur content in the sulfurized turpentine, homogeneity of the liquid gold components, i.e., absence of mechanical impurities, concentration of the initial alcohol solution of ammonium chloraurate), as well as on the conditions of application and fixation of the liquid gold on the article surface.

The purpose of our research was the optimization of this process based on a study of the literature data. Gold terpene sulfide is the main component of "liquid gold", therefore our main efforts were directed toward the improvement of this intermediate product.

As a result, a "liquid gold" compound was obtained which is distinguished by storage stability and which after firing forms on the article surface a firmly fixed film with an attractive gold color and luster.

The liquid gold produced by NPK Supermetall contains from 10 to 12% gold. It is used for different kinds of product decoration: edges, mottling, painting etc.

The main properties of the liquid gold compound are as follows:

— as it is applied on the product surface with a pen or a brush, it does not spill and dries after 10–20 min at room temperature developing a lustrous brown film;

— on firing, the liquid gold applied to glazed articles sustains a temperature of 750–830°C without burning out;

— the products on which the compound was deposited exhibit after firing a mirror-like lustrous film firmly fixed on the surface that does not wear out in the course of long-term use of the product;

The warranty period for the product is 6 months from the moment of its manufacture provided it is stored in hermetically closed bottles in cool and dry premises.

Usually the porcelain products decorated with liquid gold are fired at 790–830°C with 20 min holding time at the maximum temperature. If the firing temperature is lower, the holding time should be longer.

Faience decorated with liquid gold is fired at 760–790°C.

High-quality glass products decorated with the compound are fired at 540–600°C and cut glass is fired at around 450°C.

Owing to their good decorative properties and low consumption per surface area unit, luster paints are widely used to decorate ceramic and glass products. A special place is taken by paints containing noble metals: gold, platinum, and silver.

NPK Supermetal produces luster paints based on gold ranging from dark-red to light-pink color and from dark-blue to light blue color. Silvery (for glass and porcelain) and smoke-colored (for glass) luster paints have been developed on the basis of platinum.

REFERENCES

1. I. I. Moroz, M. S. Komskaya, and L. L. Oleinikova, *Reference Book for the Porcelain Industry* [in Russian], Vol. 2, Legkaya Industria, Moscow (1980).
2. P. A. Levin, "Factors having an effect on the quality of liquid gold," *Steklo Keram.*, No. 3, 36–39 (1968).

¹ NPK Supermetall, Moscow, Russia.